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REMARKS

Reconsideration of the above identified application is respectfully requested.

Applicants again note the substantial breadth of interpretation of Applicants' claims being proffered by the examiner, which correspondingly enlarges claim scope in later infringement analysis of the file wrapper. However, the examiner has again failed to afford due weight to specific features and cooperation of features which distinguish over the applied art.

Gas turbine engine art is quite esoteric and crowded, and requires corresponding appreciation of the specific problems being solved, and the solutions therefor in the context of those skilled in the art. See MPEP 2144.03 and In re Ahlert.

The examiner is applying references without full weight to the express teachings thereof, and the evident differences in the present invention thereover. These differences will again be repeated in view of the new rejections of record.

Applicants traverse the double-patenting rejection of claims 1, 2, 4-9, 11, and 14-21 over claims 1, 3, 5, and 9 of Lee '762.

MPEP 804 presents the test for obviousness-type double patenting as requiring the examiner to determine "whether the invention defined in a claim in the application is an obvious variation of the invention defined in a claim in the patent."

The examiner has failed to apply this test as evidenced by the examiner's contention that "the subject matter of the patent fully encompasses the limitations of the instant claims."

The test is not based on "the subject matter," but on comparison of claim-to-claim under the requirements of Section 103 and Ch. 2100 of the MPEP.

Not only are the instant claims patentably distinct from those in Lee '762, but the "subject matter" is distinct as

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well.

The present claims recite a perforate wall with covered and sealed closed pores.

The examiner's contentions presented on page 2 address other elements and overlook these fundamental features. As previously distinguished in the last amendment, the channels 6 in Lee '762 are not taught as being sealed closed (or they would not function as intended), but are covered by POROUS TBC, as expressly recited in the claims of that reference.

Col. 7, ll. 23+, explain the function of the porous TBC to expressly permit the cooling fluid to exit the channels through the porous TBC for transpiration cooling. This clearly TEACHES AWAY from Applicants' claims which require the pores to be sealed closed by the TBC: the contrast could not be any greater.

Transpiration cooling is a well known alternative to film cooling in protecting turbine components. Applicants' claims are clearly not reciting transpiration cooling in any form, and, clearly, there can be no obviousness-type double patenting of such claims over the applied claims of Lee '762, or even over the "subject matter" of that reference.

Accordingly, withdrawal of the double-patenting rejection of claims 1, 2, 4-9, 11, and 14-21 over claims 1, 3, 5, and 9 of Lee '762 is warranted and is requested.

Applicants traverse the rejection of claims 1-3 under Section 102(a) over Beeck et al.

Yet again, the examiner's contentions presented at page 3 fail to afford any weight to the express claim language that the pores are covered and sealed closed by the TBC, which prevents air discharge therefrom.

This is in stark contrast with the express teachings of Beeck at col. 1, ll. 5+; and col. 4, ll. 40+. In particular, the protective coating 10 in Beeck is an intermetallic felt specifically configured for PERMITTING air flow therethrough:

"the cooling air flows through the bores 13,13' constructed in the leading edge part outward into the protective coating

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10 of intermetallic felt."

Clearly, Beeck cannot anticipate Applicants' claims.

The examiner's further contention regarding claim 3 is erroneous since the examiner is broadly interpreting the felt coating 10 of Beeck as "thermal barrier," and that coating 10 "is attached by high-temperature soldering," col. 4, ll. 36-37, which solder must therefore also be "considered" a bond coating, in contradistinction with claim 3 which excludes bond coating.

Accordingly, withdrawal of the rejection of claims 1-3 under Section 102(a) over Beeck et al is warranted and is requested.

Applicants traverse the rejection of claims 1, 2, 4, and 19 under Section 102(b) over Scheurlen.

The examiner has failed to show that the bores 3 of Scheurlen are analogous in structure, function, performance, or purpose with the pores recited in Applicants' claims, or that the bores 3 of Scheurlen are provided in plural numbers as recited in claims 1, 2, and 4, or in multitude as recited in claim 19.

Note that Scheurlen expressly teaches at col. 5, ll. 34+, that the bores 3 and 4 are provided in the substrate to form "a cooling film on the turbine blade." The bores 3 are initially closed, and the bores 4 are initially open for this purpose.

As indicated above, turbine cooling art is quite esoteric and crowded, and is replete with terms of art for which the examiner has failed to afford due weight.

The film cooling bores 3,4 of Scheurlen are clearly not the same as the minute pores recited in Applicants' claims. Applicants' pores are defined in the specification, and are fundamentally distinguishable from the film cooling holes recited in claims 12 and 13, for example. The pores and film cooling holes have different configurations, different functions, different performance, and different purpose.

The bores 3,4 in Scheurlen would appear to b analogous

with Applicants' film cooling holes in structure, function, performance, and purpose, rendering their use in anticipating the recited pores unwarranted. By conventional negative implication practice in interpreting claims 12 and 13, the pores recited in independent claims 1 and 19 must be different; and Section 112 requires that claims be interpreted in accordance with the specification, and not in a vacuum.

Furthermore, figure 1 of Scheurlen illustrates a single bore 3 in the bottom wall, and a single bore 3 in the top wall; whereas claim 1, 2, and 4 recite plural pores in the common wall, and claim 19 recites a multitude of pores in the wall.

Accordingly, withdrawal of the rejection of claims 1, 2, 4, and 19 under Section 102(b) over Scheurlen is warranted and is requested.

Applicants traverse the omnibus rejection of claims 5-11, 14-18, 20, and 21 under Section 103(a) over Scheurlen and Bruce.

The fundamental shortcomings of Scheurlen have been addressed above, and equally apply in this rejection.

A rejection under Section 103 requires much, much more than the technical rejection under Section 102; it requires an evaluation of claims in the whole, and the references in the whole, and evidence of legal motivation for combining references.

These requirements are found in MPEP 706.02(j) and ch. 2100.

The examiner admits some of the failures of Scheurlen, and then attempts to use Bruce not for what problems are being solved, but for the disconnected "teaching of the bond coat deposited on the inner walls of the holes that is remarkable." Remarkable? For what reason?

Where is any logical or technical nexus between the disparate references? What problems are stated in the two references for which any solution therein would be relevant?

The examiner's use of the two disparate references is classic hindsight; expressly taking from Bruce only a specific feature to combine with Scheurlen without regard to analysis. This amounts to nothing more than use the two references as parts bins, and selecting only so much from each in an attempt to fabricate in hindsight a rejection under Section 103. This is clear error.

The bores 3 in Scheurlen are merely closed by the heat-insulating-layer system 2, col. 5, ll. 46+. Where is any teaching that that system should extend into the bores for any disclosed reason or benefit?

Col. 6, ll. 1+, of Scheurlen, clearly disclose for figure 2 that the layer 7 first covers the substrate 1, and then the layer 8 covers layer 7. Where is a teaching that those layers would or could extend into the closed bore 3? See figure 1, where the system 2 is not illustrated as extending into the bore 4, which is open; so why then would system 2 extend into the closed bore 3?

Note, quite fundamentally, that Bruce expressly teaches and illustrates that the cooling hole 18 is FULLY OPEN; whereas the bores 3 in Bruce are closed. What is the technical nexus between these two features, or any legal motivation to combine these features in any manner?

It is one matter to search the prior art for naked elements; but a quite another matter to then attempt to combine them in any manner, let alone in the specific manner of patent claims.

The examiner merely opines that Bruce teaches that "the deposition of a bond coat onto the holes of a metal wall is desirable for adherence of a ceramic layer, it would have been obvious to ... deposit the bond coat of Scheurlen in a manner such that the bond coat is also deposited on the walls of the bores." Why? This is mere conclusion, and is not legal motivation.

Why would it be desirable to line the bores 3 of Bruce? Those bores are closed.

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However, the bores 4 of Bruce are open. So, would it have been obvious to line those bores 4 based on Bruce? For what reason?

And, assuming arguendo that it would have been obvious to line the OPEN bores 4 of Bruce in the manner of lining the OPEN hole 18 of Bruce; where then is the nexus to jump to the conclusion that it would have also been obvious to line the CLOSED bores 3 of Bruce?

Claim 5 recites the bond coating lining the pores; claim 6 recites the TBC extending inside the pores; and claim 7 recites full lining of the bond coat. The specification explains the purpose and benefits of these claims.

So, where is any teaching in Scheurlen and Bruce relevant to these claims? The bores 3 of Scheurlen and the holes 18 of Bruce are clearly differently configured than the pores of Applicants' claims, and the examiner has not shown otherwise.

Claims 8 and 9 recite the perpendicular orientation of the pores for the benefits presented in the specification. The examiner has overlooked this claim since both Scheurlen and Bruce clearly illustrate inclined holes without any relevance to claims 8 and 9.

Claim 10 recites a specific pitch-to-diameter ratio and claim 11 recites a specific, and quite small, diameter for the benefits presented in the specification.

The examiner's mere request for a showing of "unexpected" results is not supported by the MPEP or case law, and is an inherent admission of the failure to provide any weight, let alone due weight to these claims.

The examiner's contention is also evidence of the fundamental differences of all Applicants' claims over the applied references because those references disclosure different structures, having different functions, performance, and purpose, and the examiner is unable to fabricate, even in hindsight, any reason to reject these claims over these references.

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Since the closed pores recited in claim 10 have a different purpose than the bores of Scheurlen or the holes of Bruce, the recited ratio is particular relevant for enhancing the performance thereof. Although unexpected results are not a requirement of Section 103, such unexpected results are clearly presented in the specification at various locations which support the ability of the closed pores to substantially cool the interface between the TBC and wall.

The singular closed bore 3 disclosed in Scheurlen would clearly not have this capability; nor would the film cooling hole 18 of Bruce. See para. 53 of the specification which expressly states that conventional film cooling holes, like those in Bruce, lack the performance advantage of the closed pores.

And, claim 11 recites the minute size of the pores for the "unexpected results" quite evident in the specification.

The minute pores are clearly much smaller than the large bores 4 of Scheurlen or the large holes 18 of Bruce, especially in view of the small number of such bores and hole in these references, which would require suitably large size for any efficacy at all.

Claims 14 and 15 recite specific bond coating and TBC which are effective with the small pores, yet the examiner has not found any relevant teaching in the references of applying the coatings thereof over small pores. Note that if the pores are completely filled, they would not function as intended, and the examiner has not found any teaching in these disparate references in this regard.

The examiner's grouping of claims 16, 17, 18, 20, and 21 is clearly inconsistent with the original restriction requirement of the different turbine components, and is self-evident of the failure to afford due weight to these different claims, instead attempting to rely on the expedient of "unexpected results."

Clearly, Scheurlen teaches a specific configuration of a turbine blade, with the closed bores 3 being shown in

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specific locations thereof for a specific purpose.

Notwithstanding the examiner's contention, the present specification contains ample evidence of "unexpected" results, which are substantially more "remarkable" than the simple teaching of depositing bond coat on the inner walls in Bruce. The specification clearly discloses the ability of the closed, multitude of minute pores to effectively cool the TBC-wall interface to prolong the life of the TBC; an "unexpected result" nowhere disclosed in the disparate references applied by the examiner.

There are no such multitude of minute pores in Scheurlen.

There are no such multitude of minute pores in Bruce.

Claim 16 recites the combustor liner application for these "unexpected results;" claim 17 recites the turbine nozzle vane application for these "unexpected results;" claim 18 recites the turbine nozzle band application for these "unexpected results;" claim 20 recites the turbine shroud application for these "unexpected results;" and claim 21 recites the exhaust liner application for these "unexpected results"

Each of these different applications requires different analysis in evaluating the whole thereof. The examiner's failure to find any references relevant to these applications is evidence of the non-obviousness thereof, not evidence of the obviousness thereof using the expedient of "unexpected results."

Accordingly, withdrawal of the omnibus rejection of claims 5-11, 14-18, 20, and 21 under Section 103(a) over Scheurlen and Bruce is warranted and is requested.

Applicants note the allowability of claims 12 and 13.

Accordingly, instead of rewriting these claims, Applicants have chosen to add claim 22 to recite the combination of claims 1 and 12; and add claim 23 corresponding with the features introduced in claim 13.

Independent claim 22 therefore recites the combination



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of the open film cooling holes and the multitude of closed pores for the benefits disclosed in the specification.

Claim 23 specifically recites that the pores are smaller and larger in number than the film cooling holes.

The references applied by the examiner have similarly sized holes without regard to relative quantity thereof, and clearly fail to disclose or suggest these combinations.

In view of the protracted prosecution of this application, and in order to terminate it promptly, Applicants have chosen to further amend the independent claims to recite the minute size of the pores and close pattern thereof for effectively reducing the average temperature at the TBC-wall interface. These features are described in the specification at various locations including paras. 27, 42, 43, 44, 49, 52, and 53, for example.

As indicated above, and disclosed in the specification, the recited pores 40 are minute in size, closely packed, and closed shut for effectively cooling the TBC-wall interface for enhanced durability. The pores are fundamentally different than conventional film cooling holes typically found in turbine blades, and in other hot engine components; and quite different from the various bores and holes in the applied references.

Accordingly, the claims, as so further amended, further distinguish over the applied references, and should now lead to an earlier allowance of the application.

The examiner's thoroughness of examination, and additional searching of the art is noted and appreciated. Notwithstanding the substantially crowded arts for turbine blades, vanes, bands, and shrouds; and combustor and exhaust liners, the examiner has only uncovered a modicum of references relevant to the present claims. And, these references would appear to teach away from the present invention in which a multitude of minute, closed pores are used for TBC-wall interface cooling.

In accordance with the duty imposed by 37 CFR 1.104 and

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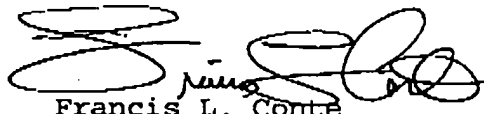
MPEP sections 707, 707.05, 707.07, and 707.07(g), the examiner is requested to reconsider all the art of record to ensure full compliance with the required thoroughness of examination.

In re Portola Packaging, Inc., 42 USPQ2d 1295 (Fed. Cir. 1997) emphasizes the importance of complying with this duty to ensure that all references of record have been fully considered by the examiner in the various combinations thereof. And, the Board of Appeals has further elaborated on the importance of this examiner duty in Ex parte Schricker, 56 USPQ2d 1723 (B.P.A.I. 2000).

Please charge the required fee for added claims 22 and 23, and any deficiency associated with this amendment, to Deposit Account No. 07-0865 of General Electric Company in accordance with attached Fee Transmittal for FY 2003.

In view of the above remarks, allowance of all claims 1-23 over the art of record is warranted and is requested.

Respectfully submitted,

  
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attachment: Fee Transmittal for FY 2003

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